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| EXAMINER |
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GREENE, DANIEL LAWSON

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| ART UNIT | PAPER NUMBER |
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3641

DATE MAILED: 04/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/671,086

Applicant(s)

ALVORD ET AL.

Examiner

Daniel L Greene Jr.

Art Unit

3641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9/25/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. A signed and dated IDS (received 9/25/2003) is attached to the instant Office action.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a) because they fail to show;
 - a. inlet port 220,
 - b. outlet port 222,
 - c. how inlet port 220 and outlet port 222 are connected to the target chamber 104' in order to function as described in the specification paragraph [0028]. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d).
3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 306 and 308. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application.
4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because;

A. reference character "104" has been used to designate both a target chamber and a cooling channel (see Fig. 1 and specification paragraphs [0009] and [0010],

B. reference characters "102", "104" and "306" have both been used to designate what appears to be the same coolant channel.

5. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. These objections to the drawings will not be held in abeyance.

Specification

6. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because:

A. Of the relative and/or contradictory terms used throughout, for example, minimal conduction paths yet increased cooling capacity, superior oxidation resistance, high beam currents (as compared to what?) high Reynolds number flow (compared to

Art Unit: 3641

what, is 100, 1,000 or 10,000 considered high or is this flow being compared to prior art?), etc.

B. It is unclear whether the internal cooling channels have minimal conduction paths and high Reynolds number flows or the target assembly has minimal conduction paths and high Reynolds number flows

Correction is required. See MPEP § 608.01(b).

Claim Objections

7. **Claims 16 and 21 are objected to because of the following informalities:**

claim 21 appears to be identical to claim 16. Appropriate correction is required.

Specification Objection - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. **The specification is objected to under 35 U.S.C 112, first paragraph, as failing to provide an adequate written description of the invention and as failing to adequately teach how to make and/or use the invention, i.e. failing to provide and enabling disclosure.**

A. Paragraph [0027] states that it is the high Reynolds number indicating turbulent flow that compensates for the low thermal conductivity of the tantalum target assembly, but paragraph [0029] contradicts this by stating it is the

developed flow of the cooling water that allows for greater heat transfer, therefore the specification is insufficient and non enabling in disclosing how and in what manner the lower thermal conductivity is accounted for.

B. Paragraph [0031] states that the function of inducing fluid flow within the target chamber is accomplished by the shape of the target chamber and in another embodiment it is the size of the front window. The specification is insufficient in disclosing how and in what manner either of these will actually induce said flow.

C. The specification is insufficient in disclosing the meets and bounds of the terms “developed flow”, “nearly developed flow”, “fully developed flow” and “turbulent flow”

Claim Rejections - 35 USC § 112

9. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. **Claims 7, 8, 22-27, 29-31, 33 and 34 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling.** The definitions, meets and bounds of the term developed flow and what Reynolds number indicates a turbulent flow, critical or essential to the practice of the invention, but not included in the claim(s)

is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Clearly the rate of transfer of heat depends upon such limitations and applicant's alleged invention will not operate as claimed without such.

12. **Claims 10 and 32 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for irradiation by a proton particle beam, does not reasonably provide enablement for irradiation by any other type of particle beam.** The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. The limitations "irradiation" and "bombarded with a particle beam" includes the use of other types of particles other than protons. The disclosure fails to define exactly what or which "particles" applicant's invention is capable of use with. Would the target still function if for example it was bombarded or irradiated with a beam of gamma, Helium, neutron or electron particles?

13. **Claim 29 is rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling.** The required size of the cooling channel, critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). The disclosure fails to disclose the basis for, how and in what manner the cooling channels are sized in order to sustain or even develop a developed flow within. It is questioned how and in what manner the applicant has determined the type of flow (laminar, turbulent, etc.) within ANY of the cooling channels.

14. Claims 4 and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A. Claim 4 recites the limitation "a third channel" in the first and second line.

There is insufficient antecedent basis for this limitation, as no second channel exists in either claim 4 or claim 1 from which it depends.

B. Claim 34 recites the limitation "said first cooling channel" in the first line.

There is insufficient antecedent basis for this limitation in the claim.

15. The phrase "Reynolds number indicating a turbulent flow" in Claims 8, 25-27 and 34 is a relative term which renders the claims indefinite. The phrase "Reynolds number indicating a turbulent flow " is not defined by the claims, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The requisite degree of how or what numbers would satisfy said claims is unascertainable.

16. Claims 5, 14 and 30 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the manner in which the cooling channels are connected in order for coolant to flow through the target body, for example the claims fail to disclose if the third and fourth cooling channels are connected to each other, if the third and fourth channels are separate and independent of the first and second channels, etc., etc., etc.

Art Unit: 3641

17. **Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are:**

- A. The manner of shaping a target chamber such that a steam jet is formed in the manner proposed,
- B. the manner of shaping a target chamber such that a steam jet flows into a steam bubble in the manner proposed,
- C. the manner in which the first cooling channel transfers heat directly from the steam bubble thereby condensing said bubble when the first cooling channel is isolated from the target chamber and therefore said steam bubble.

Claim Rejections - 35 USC § 102

18. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

19. **Claims 1-5, 7-11, 13-15, 17-20, 22-28, and 32-34 are rejected under 35 U.S.C. 102(b) as anticipated by U.S. Patent 6,586,747 B1 to Erdman.**

Regarding claims 1 and 33, Erdman clearly discloses an apparatus (12) for containing and cooling enriched water for the production of fluorine- 18, said apparatus comprising: a target body (52) for coupling to an accelerator; a target chamber (60) for holding a volume of enriched water within said target body, said target chamber having an upper wall (64) defined by said target body (means for containing a target liquid for irradiation); and a first cooling channel (74) spaced a selected distance from said upper wall for removing heat contained in said target chamber, said first cooling channel isolated from said target chamber; said cooling channel for receiving a cooling fluid (means for cooling said apparatus) in figures 1-3 and column 3 lines 62+ and column 4 lines 1+.

Erdman further discloses claims 2 and 3 wherein the apparatus (12) further includes a second cooling channel (76) spaced a selected distance from a back wall (considered to be the left side of target chamber (60)) of said target chamber (60) for removing heat contained in said target chamber, said second cooling channel in fluid communication with and flowing into said first cooling channel (74) in the rejection of corresponding parts of claim 1 above and in column 7 lines 33-52.

Erdman further discloses claim 4 wherein the apparatus (12) includes a third cooling channel (74) parallel to said first cooling channel, said third cooling channel spaced a selected distance from said upper wall.

Erdman further discloses claim 5 wherein the apparatus (12) further includes a second cooling channel spaced a selected distance from a back wall

of said target chamber for removing heat contained in said target chamber; a third cooling channel substantially parallel to said first cooling channel, said third cooling channel spaced a selected distance from said upper wall for removing heat contained in said target chamber; and a fourth cooling channel (78) substantially parallel to said second cooling channel, said fourth cooling channel spaced a selected distance from said back wall for removing heat contained in said target chamber in the rejection of corresponding parts of claims 1, 2 and 4 above.

With regard to claims 7, 8, 33 and 34 the cooling channels of Erdman are clearly capable of performing the limitations claimed by simply varying the flow rate of coolant through the cooling channels.

Please note that statements as to possible future acts or to what may happen in a method or operation, or to the operation of the cooling channel to obtain different flow types, are essentially method limitations or statements of intended or desired use and do not serve to patentably distinguish the claimed structure over that of the references. See In Re Pearson, 181 USPQ 641; In re Yanush, 177 USPQ 705; In re Finsterwalder, 168 USPQ 530; In re Casey, 152 USPQ 235; In re Otto, 136 USPQ 458; Ex parte Masham, 2 USPQ 2nd 1647.

See MPEP 2114 which states:

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ 2nd 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions. In re Danly, 120 USPQ 528, 531.

Apparatus claims cover what a device is, not what a device does. Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ 2nd 1525, 1528

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon, does not serve to limit an apparatus claim.

Erdman further discloses claim 9 wherein it is understood that in Figure 3 the left side of the target chamber (60) reads on the "back wall" and a front surface reads on front window (62)

Erdman clearly discloses claims 10 and 11 wherein the target chamber is shaped such that a quantity of enriched water in said target chamber undergoes natural circulation (means for inducing fluid flow) when bombarded with a particle beam, in the rejection of corresponding parts of claim 1, Fig. 3 and column 7 lines 4-32.

Erdman discloses claim 13 in the rejection of corresponding parts of claims 1 and 2 above.

Erdman discloses claim 14 in the rejection of corresponding parts of claims 1, 2 and 5 above.

Erdman discloses claim 15 in the rejection of corresponding parts of claims 1, 2 and 3 above.

Erdman discloses claim 17 in the rejection of corresponding parts of claims 1, 2 and 9 above.

Erdman discloses claim 18 in the rejection of corresponding parts of claims 1, 2 and 11 above.

Erdman discloses claim 19 in the rejection of corresponding parts of claims 1, 2 and 10 above.

With regard to claim 20 the target chamber of Erdman is fully capable of performing the limitations claimed.

Please note that statements as to possible future acts or to what may happen in a method or operation, or to the formation of a steam jet flowing into a steam bubble and subsequently condensing, are essentially method limitations or statements of intended or desired use and do not serve to patentably distinguish the claimed structure over that of the references. See In Re Pearson, 181 USPQ 641; In re Yanush, 177 USPQ 705; In re Finsterwalder, 168 USPQ 530; In re Casey, 152 USPQ 235; In re Otto, 136 USPQ 458; Ex parte Masham, 2 USPQ 2nd 1647.

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Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions. In re Danly, 120 USPQ 528, 531.

Apparatus claims cover what a device is, not what a device does. Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ 2nd 1525, 1528

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon, does not serve to limit an apparatus claim.

With regard to claims 22-27 the cooling channels of Erdman are clearly capable of performing the limitations claimed by simply varying the flow rate of coolant through the cooling channels.

Please note that statements as to possible future acts or to what may happen in a method or operation, or to the operation of the cooling channel to obtain different flow types, are essentially method limitations or statements of intended or desired use and do not serve to patentably distinguish the claimed structure over that of the references. See In Re Pearson, 181 USPQ 641; In re Yanush, 177 USPQ 705; In re Finsterwalder, 168 USPQ 530; In re Casey, 152 USPQ 235; In re Otto, 136 USPQ 458; Ex parte Masham, 2 USPQ 2nd 1647.

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A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ 2nd 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions. In re Danly, 120 USPQ 528, 531.

Apparatus claims cover what a device is, not what a device does. Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ 2nd 1525, 1528

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon, does not serve to limit an apparatus claim.

20. Claims 1-5, 7-15, 17-20, 22-28 and 32-34 are rejected under 35 U.S.C. 102(a) as anticipated by APA (Admitted Prior Art).

Regarding claims 1 and 33, APA clearly discloses an apparatus (110) for containing and cooling enriched water for the production of fluorine- 18, said apparatus comprising: a target body for coupling to an accelerator; a target chamber (104) for holding a volume of enriched water within said target body, said target chamber having an upper wall (upper wall of target chamber) defined by said target body (means for containing a target liquid for irradiation); and a first cooling channel (102) spaced a selected distance from said upper wall for removing heat contained in said target chamber, said first cooling channel isolated from said target chamber, said cooling channel for receiving a cooling fluid (means for cooling said apparatus) in figures 1-3 and applicants disclosure paragraphs [0008] – [0012].

APA further discloses claims 2 and 3 wherein the apparatus (110) further includes a second cooling channel (202) spaced a selected distance from a back wall of said target chamber (104) for removing heat contained in said target chamber, said second cooling channel in fluid communication with and flowing into said first cooling channel (102) in the rejection of corresponding parts of claim 1 above see for example paragraph [0009].

APA further discloses claim 4 wherein the apparatus (12) includes a third cooling channel (104) parallel to said first cooling channel, said third cooling channel spaced a selected distance from said upper wall.

APA further discloses claim 5 wherein the apparatus (12) further includes a second cooling channel spaced a selected distance from a back wall of said

Art Unit: 3641

target chamber for removing heat contained in said target chamber; a third cooling channel substantially parallel to said first cooling channel, said third cooling channel spaced a selected distance from said upper wall for removing heat contained in said target chamber; and a fourth cooling channel (204) substantially parallel to said second cooling channel, said fourth cooling channel spaced a selected distance from said back wall for removing heat contained in said target chamber in the rejection of corresponding parts of claims 1, 2 and 4 above.

With regard to claims 7, 8, 33 and 34 the cooling channels of APA are clearly capable of performing the limitations claimed by simply varying the flow rate of coolant through the cooling channels.

Please note that statements as to possible future acts or to what may happen in a method or operation, or to the operation of the cooling channel to obtain different flow types, are essentially method limitations or statements of intended or desired use and do not serve to patentably distinguish the claimed structure over that of the references. See In Re Pearson, 181 USPQ 641; In re Yanush, 177 USPQ 705; In re Finsterwalder, 168 USPQ 530; In re Casey, 152 USPQ 235; In re Otto, 136 USPQ 458; Ex parte Masham, 2 USPQ 2nd 1647.

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Apparatus claims cover what a device is, not what a device does. Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ 2nd 1525, 1528

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon, does not serve to limit an apparatus claim.

APA clearly discloses claim 9 in Figure 3.

APA further discloses claims 10 and 11 wherein the target chamber is shaped such that a quantity of enriched water in said target chamber undergoes natural circulation (means for inducing fluid flow) when bombarded with a particle beam, in the rejection of corresponding parts of claim 1 above, Fig. 3 and for the same reasons proposed by applicant in paragraphs [0029] – [0031] wherein it is understood that according to paragraph [0009] the flow of cooling water is from the bottom of the target assembly towards the top, just as in applicant's invention, the APA would inherently operate in the same manner. APA inherently operates as claimed since the beam strike area is at the lower area of the target assembly and as admitted, the target liquid heats up when bombarded and since heat rises, clearly natural circulation must take place due to well established natural laws of thermodynamics. Again, APA is clearly capable of operating in the manner claimed and as such, applicant has again attempted to incorporate a method of operating APA and therefore the previous statements of intended use apply here as well.

APA discloses claim 12 in Figure 1 and the rejection of corresponding parts of claims 1 above.

APA discloses claim 13 in the rejection of corresponding parts of claims 1 and 2 above.

APA discloses claim 14 in the rejection of corresponding parts of claims 1, 2 and 5 above.

APA discloses claim 15 in the rejection of corresponding parts of claims 1, 2 and 3 above.

APA discloses claim 17 in the rejection of corresponding parts of claims 1, 2 and 9 above.

APA discloses claim 18 in the rejection of corresponding parts of claims 1, 2 and 11 above.

APA discloses claim 19 in the rejection of corresponding parts of claims 1, 2 and 10 above.

With regard to claim 20 the target chamber of APA is fully capable of performing the limitations claimed.

Please note that statements as to possible future acts or to what may happen in a method or operation, or to the formation of a steam jet flowing into a steam bubble and subsequently condensing, are essentially method limitations or statements of intended or desired use and do not serve to patentably distinguish the claimed structure over that of the references. See *In Re Pearson*, 181 USPQ

Art Unit: 3641

641; In re Yanush, 177 USPQ 705; In re Finsterwalder, 168 USPQ 530; In re Casey, 152 USPQ 235; In re Otto, 136 USPQ 458; Ex parte Masham, 2 USPQ 2nd 1647.

See MPEP 2114 which states:

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Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions. In re Danly, 120 USPQ 528, 531.

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With regard to claims 22-27 the cooling channels of APA are clearly capable of performing the limitations claimed by simply varying the flow rate of coolant through the cooling channels.

Please note that statements as to possible future acts or to what may happen in a method or operation, or to the operation of the cooling channel to obtain different flow types, are essentially method limitations or statements of intended or desired use and do not serve to patentably distinguish the claimed structure over that of the references. See In Re Pearson, 181 USPQ 641; In re Yanush, 177 USPQ 705; In re Finsterwalder, 168 USPQ 530; In re Casey, 152 USPQ 235; In re Otto, 136 USPQ 458; Ex parte Masham, 2 USPQ 2nd 1647.

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Art Unit: 3641

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As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon, does not serve to limit an apparatus claim.

APA discloses claim 28 in the rejection of corresponding parts of claims 1, 2 and 12 above.

21. Claims 1-4, 6-13, 15-29 and 31-34 are rejected under 35 U.S.C. 102(b) as anticipated by "Tantalum [¹⁸ O] Water Target for the Production of [¹⁸F] Fluoride with High Reactivity for the Preparation of 2-DEOXY-2-[¹⁸F] Fluoro-D-Glucose," by N. Satyamurthy, Bernard Amarasekera, C. William Alvord, Jorge R. Barrio, Michael E. Phelps, in Molecular Imaging and Biology, Vol. 4, No. 1, at 65-70 (2002) (hereafter Satyamurthy et al.).

Regarding claims 1 and 33, SATYAMURTHY ET AL. clearly discloses an apparatus for containing and cooling enriched water for the production of fluorine- 18, said apparatus comprising: a target body for coupling to an accelerator; a target chamber for holding a volume of enriched water within said target body, said target chamber having an upper wall (upper wall of target chamber) defined by said target body (means for containing a target liquid for

irradiation); and a first cooling channel spaced a selected distance from said upper wall for removing heat contained in said target chamber (see for example in Fig. 1, the cooling water arrow indicating coolant flow into the target body), said first cooling channel isolated from said target chamber, said cooling channel for receiving a cooling fluid (means for cooling said apparatus) in figure 1 and pages 66-69.

SATYAMURTHY ET AL. further discloses claims 2 and 3 wherein the apparatus further includes a second cooling channel, see for example in Fig. 1, one of the cooling water arrows indicating coolant flow out of the target body which is clearly, spaced a selected distance from a back wall of said target chamber for removing heat contained in said target chamber, said second cooling channel in fluid communication with and flowing into said first cooling channel in the rejection of corresponding parts of claim 1 above.

SATYAMURTHY ET AL. further discloses claim 4 wherein the apparatus includes a third cooling channel parallel to said first cooling channel (see for example in Fig. 1, one of the cooling water arrows indicating coolant flow out of the target body), said third cooling channel spaced a selected distance from said upper wall.

SATYAMURTHY ET AL. clearly discloses claim 6, in its title as well as the in the rejection of corresponding parts of claim 1 above.

With regard to claims 7, 8, 33 and 34 the cooling channels of SATYAMURTHY ET AL. are clearly capable of performing the limitations claimed by simply varying the flow rate of coolant through the cooling channels.

Please note that statements as to possible future acts or to what may happen in a method or operation, or to the operation of the cooling channel to obtain different flow types, are essentially method limitations or statements of intended or desired use and do not serve to patentably distinguish the claimed structure over that of the references. See *In Re Pearson*, 181 USPQ 641; *In re Yanush*, 177 USPQ 705; *In re Finsterwalder*, 168 USPQ 530; *In re Casey*, 152 USPQ 235; *In re Otto*, 136 USPQ 458; *Ex parte Masham*, 2 USPQ 2nd 1647.

See MPEP 2114 which states:

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ 2nd 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions. *In re Danly*, 120 USPQ 528, 531.

Apparatus claims cover what a device is, not what a device does. *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 15 USPQ 2nd 1525, 1528

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon, does not serve to limit an apparatus claim.

SATYAMURTHY ET AL. clearly discloses claim 9 in Figure 1, wherein the back wall of the upper portion of the target chamber labeled "Reflux Volume" reads on the back wall.

SATYAMURTHY ET AL. further discloses claims 10 and 11 wherein the target chamber is shaped such that a quantity of enriched water in said target chamber undergoes natural circulation (means for inducing fluid flow) when bombarded with a particle beam, in the rejection of corresponding parts of claim 1 above, Fig. 1 wherein it is understood that SATYAMURTHY ET AL. would inherently operate in the same manner because the beam strike area is at the lower area of the target assembly and as applicant admitted, the target liquid heats up when bombarded and since heat rises, clearly natural circulation must take place due to the aforementioned well established natural laws of thermodynamics. Again, SATYAMURTHY ET AL. is clearly capable of operating in the manner claimed and as such. It is noted that applicant has again attempted to incorporate a method of operation and therefore the previous statements of intended use apply here as well.

SATYAMURTHY ET AL. discloses claim 12 in Figure 1 (reads on the dotted line of the "FRONT END") and the rejection of corresponding parts of claims 1 above.

SATYAMURTHY ET AL. discloses claim 13 in the rejection of corresponding parts of claims 1 and 2 above.

SATYAMURTHY ET AL. discloses claim 15 in the rejection of corresponding parts of claims 1, 2 and 3 above.

SATYAMURTHY ET AL. discloses claim 16 in the rejection of corresponding parts of claims 1, 2 and 6 above.

SATYAMURTHY ET AL. discloses claim 17 in the rejection of corresponding parts of claims 1, 2 and 9 above.

SATYAMURTHY ET AL. discloses claim 18 in the rejection of corresponding parts of claims 1, 2 and 11 above.

SATYAMURTHY ET AL. discloses claim 19 in the rejection of corresponding parts of claims 1, 2 and 10 above.

With regard to claim 20 the target chamber of SATYAMURTHY ET AL. is fully capable of performing the limitations claimed.

Please note that statements as to possible future acts or to what may happen in a method or operation, or to the formation of a steam jet flowing into a steam bubble and subsequently condensing, are essentially method limitations or statements of intended or desired use and do not serve to patentably distinguish the claimed structure over that of the references. See *In Re Pearson*, 181 USPQ 641; *In re Yanush*, 177 USPQ 705; *In re Finsterwalder*, 168 USPQ 530; *In re Casey*, 152 USPQ 235; *In re Otto*, 136 USPQ 458; *Ex parte Masham*, 2 USPQ 2nd 1647.

See MPEP 2114 which states:

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ 2nd 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions. *In re Danly*, 120 USPQ 528, 531.

Apparatus claims cover what a device is, not what a device does. *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 15 USPQ 2nd 1525, 1528

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon, does not serve to limit an apparatus claim.

SATYAMURTHY ET AL. discloses claim 21 in the rejection of corresponding parts of claims 1, 2 and 6 above.

With regard to claims 21-27 the cooling channels of SATYAMURTHY ET AL. are clearly capable of performing the limitations claimed by simply varying the flow rate of coolant through the cooling channels.

Please note that statements as to possible future acts or to what may happen in a method or operation, or to the operation of the cooling channel to obtain different flow types, are essentially method limitations or statements of intended or desired use and do not serve to patentably distinguish the claimed structure over that of the references. See *In Re Pearson*, 181 USPQ 641; *In re Yanush*, 177 USPQ 705; *In re Finsterwalder*, 168 USPQ 530; *In re Casey*, 152 USPQ 235; *In re Otto*, 136 USPQ 458; *Ex parte Masham*, 2 USPQ 2nd 1647.

See MPEP 2114 which states:

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ 2nd 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions. *In re Danly*, 120 USPQ 528, 531.

Apparatus claims cover what a device is, not what a device does. *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 15 USPQ 2nd 1525, 1528

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon, does not serve to limit an apparatus claim.

SATYAMURTHY ET AL. discloses claim 28 in the rejection of corresponding parts of claims 1, 2 and 12 above.

SATYAMURTHY ET AL. discloses claim 29 in the rejection of corresponding parts of claims 1, 2, 6 and 9 above wherein it is understood that SATYAMURTHY ET AL. is inherently sized appropriately to permit coolant flow and clearly capable of allowing varying coolant flow rates through the cooling channels to obtain the desired flow. The previous notes on method limitations in the preceding claims fully apply here as there.

Claim Rejections - 35 USC § 103

22. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

23. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

24. **Claims 6, 16, 21, 29, and 30 are rejected under 35 U.S.C. 103(a) as obvious over Erdman in view of "Tantalum [¹⁸ O] Water Target for the Production of [¹⁸F] Fluoride with High Reactivity for the Preparation of 2-DEOXY-2-[¹⁸F] Fluoro-D-Glucose," by N. Satyamurthy, Bernard Amarasekera, C. William Alvord, Jorge R. Barrio, Michael E. Phelps, in Molecular Imaging and Biology, Vol. 4, No. 1, at 65-70 (2002) (hereafter Satyamurthy et al.).**

With regard to claim 6, Erdman discloses applicant proposed invention substantially as claimed and described in section 19 above including in column 3 lines 15-22 "the holder body is a chemically inert material unreactive with the selected liquid target" and column 8 lines 26-30 that "the teachings provided herein can be applied to other suitable materials" but Erdman does not specifically disclose that the target body is fabricated out of tantalum.

Satyamurthy et al. disclose that there has been more that two decades of ongoing development of cyclotron target bodies for the production of the ¹⁸F fluoride ion and discusses the benefits and drawbacks of various materials in the fabrication of said target bodies. Satyamurthy et al. further teaches that the rationale for the choice of tantalum is its relatively low activation by protons and its general chemical inertness and it has a higher thermal conductivity than titanium (another typical target body material)

At the time of applicants invention, it would have been obvious to one of ordinary skill in the art to fabricate the target body of Erdman out of tantalum for the benefits stated within both references as such is nothing more than well known functionally equivalent material.

Erdman discloses claim 16 in the rejection of corresponding parts of claims 1, 2 in section 19 and 6 above.

Erdman discloses claim 21 in the rejection of corresponding parts of claims 1, 2 in section 19 and 6 above.

Erdman discloses claim 29 in the rejection of corresponding parts of claims 1, 2, and 9 in section 19 and 6 above wherein it is understood that Erdman is sized appropriately and clearly capable of simply varying the coolant flow rate through the cooling channels to obtain the desired flow and the previous notes of method limitations in the preceding claims fully apply here as there.

Erdman discloses claim 30 in the rejection of corresponding parts of claims 1, 5, and 9 in section 19 and claim 6 above.

25. Claims 6, 16, 21, and 29-31 are rejected under 35 U.S.C. 103(a) as obvious over APA (Admitted Prior Art) in view of "Tantalum [¹⁸ O] Water Target for the Production of [¹⁸F] Fluoride with High Reactivity for the Preparation of 2-DEOXY-2-[¹⁸F] Fluoro-D-Glucose," by N. Satyamurthy, Bernard Amarasekera, C. William Alvord, Jorge R. Barrio, Michael E. Phelps, in Molecular Imaging and Biology, Vol. 4, No. 1, at 65-70 (2002) (hereafter Satyamurthy et al.).

With regard to claim 6, APA discloses applicant proposed invention substantially as claimed and described in section 20 above, however APA does not expressly disclose that the target body is fabricated out of tantalum.

Satyamurthy et al. disclose that there has been more that two decades of ongoing development of cyclotron target bodies for the production of the ^{18}F fluoride ion and discusses the benefits and drawbacks of various materials in the fabrication of said target bodies. Satyamurthy et al. further teaches that the rationale for the choice of tantalum is its relatively low activation by protons and its general chemical inertness and it has a higher thermal conductivity than titanium (another typical target body material)

At the time of applicant's invention, it would have been obvious to one of ordinary skill in the art to fabricate the target body of APA out of tantalum for the benefits of relatively low activation by protons and its general chemical inertness as such is no more than functionally equivalent material.

APA discloses claim 16 in the rejection of corresponding parts of claims 1, 2 in section 20 and 6 above.

APA discloses claim 21 in the rejection of corresponding parts of claims 1, 2 in section 20 and 6 above.

APA discloses claim 29 in the rejection of corresponding parts of claims 1, 2, and 9 in section 20 and 6 above wherein it is understood that APA is sized to permit coolant flow and clearly capable of allowing varying coolant flow rates

though the cooling channels to obtain the desired flow and the previous notes of method limitations in the preceding claims fully apply here as there.

APA discloses claim 30 in the rejection of corresponding parts of claims 1, 5, and 9 in section 20 and 6 above.

APA discloses claim 31 in the rejection of corresponding parts of claims 1, 5, 9, and 12 in section 20 and 6 above.

Conclusion

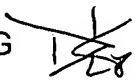
26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

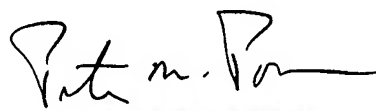
27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel L Greene Jr. whose telephone number is (571) 272-6876. The examiner can normally be reached Monday thru Friday 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael J Carone can be reached on (571) 272-6873. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 3641

28. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DIG 
April 15, 2005


PETER M. POON
SUPERVISORY PATENT EXAMINER
4/18/05